Appendix B

Downey Police Department

SMS Text-to-9-1-1 via TTY/TDD

Re-Test Results

March 5, 2014

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Test Cases

1. Test transfer functions of Standard TTY
2. Verify test 9-1-1 SMS text is delivered to correct PSAP and rebid capability
3. Verify transfer functions of SMS text-to-911
4. Verify transfer to CSU Long Beach PD (is it delivered TTY or GEM)
5. Verify text conversation is still up if cell phone is powered down and powered up
6. Verify ability for second call taker to take over SMS session
7. Verify results when texter send more than 160 characters and verify results when sending symbols not supported in TTY.
8. Verify results of simultaneous texts (call taker and texter) and 5 rapid test from texter (what is received on call taker position)

CASE #1	Test transfer functions of standard TTY
Objective/ Description	This test verifies the flow of a standard TTY call received at Downey PD and sent to Downey Fire --- on existing tandem trunks
Resources	Access to TTY machine Downey PD call taker to receive TTY Call Downey FD to receive the transfer
Test Setup	1 Verify Downey PD is available for a TTY call 2.Verify Downey Fire is available for a TTY transfer
Procedure	1. Send a TTY Call to Downey PD 2. Send a couple of TTY messages back and forth 3. Transfer TTY call to Downey Fire 4. Once Downey Fire is on the call send a few messages 5. Downey PD releases the call 6. Once Downey is off the call have TTY caller exchange a few messages with Downey Fire then have TTY Caller disconnect
Verification	1. Verify Downey Fire is added to the session 2. Verify all parties can see the TTY messages. 3. Verify how the call came into Downey Fire (ie did the TTY screen just pop open, could Downey Fire tell there was a TTY caller, can Downey PD send a TTY message explaining the situation or should Downey PD call first to advise they are transferring a TTY caller
Text time	Send to receive:
Notes:	Date/Time: Tester: Document all aspects of the transfer Test was not performed.

CASE #2	Texter send 9-1-1 SMS text and routes to Downey PD and test rebid
Objective/ Description	This test verifies Text can be delivered to Downey PD and rebid for location is functioning. (Will test twice once with Phone equipment with location agent app an once with phone without location agent
Resources	Texter in field and centroid within Downey PD's jurisdiction. Verizon cell phone with location agent activated Call taker to receive text TCS to monitor text session
Test Setup	1. Verify Texter is ready 2. Verify TCC is provisioned and ready for Downey PD to receive texts 3. Verify the Downey PD is available.
Procedure	1. Send a SMS text to 911 to initiate a dialog. 2. Respond to the incoming texter at the PSAP and send a few messages back and forth between the PSAP and texter. 3. After 20 seconds rebid for location. 4. PSAP ends text session.
Verification	1. Verify the text is received by the PSAP configured for this test case. 2. Verify the transcript is received by the PSAP when the dialog connected, and location information is properly displayed and call back number displayed. 3. Verify all messages sent by the PSAP are sent to the mobile handset. 4. Verify all messages sent by the mobile are received by the PSAP. 5. verify lat/long changes from centroid to actual location of texter 6. Verify release text received by Texter.
Text time	Send to receive:
Notes	Was location populated in CAD? Rebid was inconsistent during our testing on January 8th, TCS change some setting and now should be more consistent… Downey PD removed time of day setting at 9:00 AM Verizon technician set the two test trunks back to "normal" at 3.5db both in and out Texter's Location: Downey PD Test text from 916-202-XXXX at 10:01:16 "Test message to Downey PD" Received at 10:01:29 garbled "Tet vesagel to Downey PD" PSAP sent "Don't hang up", texter received fine Texter sent "I will hold the line" at 10:03:40 Received "I wlholzgth lineg" PSAP sent "What is the problem and where is the problem so I can send help" Texter received fine and sent "The problem is in the PSAP" Received "Tjlpoc I in tebpsap a" End session initiated by Downey PD. Verizon technician changed PBX setting from medium to short CO on the trunks. Test text from 9116-202-XXXX at 10:13:10 "Text message after adjustment" Received at 10:13:33 garbled "Texmlesaf aft lpfusit a"

	Message from PSAP to texter is clear. End session initiated by Downey PD. Verizon technician changed PBX setting from short CO to short PBX. Test text from 916-202-XXXX at 10:17:30 “Sample text message short PBX” Received on trunk 235 garbled “-0)3 53/9 MESAGE SHORT PBX” Texter sent “resent sample message short PBX” Received “ RP PD AMPLE MESSAGE HOT PBXDXA” End session initiated by Downey PD. Verizon technician changed all PBX levels back to baseline levels. Verizon changed impedance to 900olms. Test text from 916-202-XXXX at 10:27:58 and received at 10:28:24 on trunk 170 TTY window did not open End session initiated by Downey PD. Test text from 916-202-XXXX at 10:33:07 and received at 10:33:33 on trunk 170 TTY window did not open PSAP sent “9-1-1 do you need police” Texter received and sent “This is a test”, received “OTAT THIS TIE” End session initiated by Downey PD. Test text from 562-665-0182 at 10:35:06 and received at 10:35:22 on trunk 235 TTY window did not launch End session initiated by Downey PD. Test text from 916-202-XXXX and received at 10:36:40 on trunk 170 Texter sent 4 spaces prior to text, TTY window opened but message was garbled End session initiated by Downey PD. Two tests sent from the TTY machine to Downey PD on their regular trunks at 10:43:13 and 10:44:30 Used 4 spaces on TTY machine as is customary, messages back and forth ok. End session initiated by Downey PD. Verizon technicians added 6db of padding to bring the trunk level to -9.5db on only trunk 235. Test text message from 916-202-XXXX at 10:57:41 “Test with 6db of padding” Received at 10:58:06 on trunk 235 no garbling Sent several messages including alphabet and numbers and all received well End session initiated by Downey PD. Test text from 916-202-XXXX at 11:00:58 and received at 11:01:26 on trunk 170 TTY window did not launch automatically First message is slightly garbled, alphabet is seriously garbled. Test text from 916-202-XXXX at 11:05:55 “Sample test message 6DB padded” Received at 11:06:22 on trunk 235 with no garbling. End session initiated by Downey PD.

CASE #3	Test transfer functions of SMS Text-to-9-1-1
Objective/ Description	This test verifies the flow of SMS text-to-9-1-1 received at Downey PD and transferred to Downey Fire
Resources	Texter in field within Downey PD's jurisdiction. Call taker to receive text TCS to monitor text session Timer to time send receive time
Test Setup	1. Mobile phone activated and ready 2. Verify TCC is provisioned and ready 3. Verify Downey PD and Downy Fire are available.
Procedure	1. Send a SMS Text message to Downey PD 2. Send a couple of messages back and forth 3. Transfer SMS Texter to Downey Fire 4. Once Downey Fire is on the call have Downey PD and Texter send a few messages 5. Downey PD releases the text session 6. Once Downey PD is off the call have texter exchange a few messages with Downey Fire then have Downey Fire release the text
Verification	1. Verify Downey Fire is added to the session 2. Verify Downey PD can still text once Downey Fire is added 2. Verify all parties can see the SMS Text messages. 3. Verify how the call came into Downey Fire (ie did the TTY screen just pop open, could Downey Fire tell there was an SMS Text-to9-1-1 message, can Downey PD send a SMS Text-to-9-1-1 message explaining the situation or should Downey PD call first to advise they are transferring an SMS Text-to-9-1-1 session
Text time	Send to receive:
Notes	Document all aspects of this transfer, does it function the same as a TTY transfer? Test text from 916-202-XXXX at 11:45:00 Received at Downey PD at 11:45:32 on trunk 235, no ANI/ALI Texter and call taker text back and forth with minimal garbling on the call taker TTY screen Downey PD initiates transfer to Downey Fire at 11:47:36 via star code transfer Received at Fire, Fire TTY window launches and automatic message is sent (Downey PD sent 4 spaces to launch Fire's TTY window?) Fire, PD, and texter able to send messages back and forth in a 3-way conference PD releases the line Fire and texter continued messages back and forth End session initiated by Downey Fire when they released the 9-1-1 trunk. Test text from 562-665-0182 at 11:54 Received at Downey PD at 11:54:52 on trunk 235, TTY window did not open automatically Texter's messages are garbled Downey PD transfers texter to Fire Fire has an open line with no voice and no baudot tones Downey PD, still conferenced with tester and Fire, sends 4 spaces Downey PD and texter then receive automatic message from Fire End session initiated by Downey PD and Fire to release texter Test text from 562-665-0182 at 12:00:42 Received at Downey PD on trunk 235, TTY window did not open automatically and first message from texter was not received

	Text messages between texter and Downey PD minimally garbled Downey PD initiates transfer to Downey Fire at 12:03:50 Downey PD send 4 spaces, Fire only receives one audible tone Downey PD sends 4 spaces again, Fire hears tones but they are delayed Downey PD deactivated TTY screen and sent 4 spaces, Fire screen activated and sent automatic TTY greeting Downey Fire and texter are then able to text back and forth successfully End session initiated by Downey PD and Fire to release texter Test text from 562-665-0182 Received at Downey PD at 12:16:55 on trunk 235 Downey PD initiated a transfer to Fire at 12:18:23 Downey PD disabled TTY screen, allowing PD to verbally speak to fire on the open line and explain that this was a transfer from PD with a text caller on the line Downey PD sent 4 spaces, which did not activate the TTY screen at fire Downey Fire manually activated their TTY screen Downey PD TTY screen is still inactive, Fire TTY screen is now active and able to talk with the texter Fire is receiving garbled messages from the texter Downey PD alternates between active and inactive TTY screen and able to see messages received when TTY screen is active Downey PD releases the line so that only Fire and the texter are now on the line Texts sent back and forth between Downey Fire and texter are not as garbled once Downey PD releases the line End session initiated by Downey Fire Test text from 916-202-XXXX at 12:30:30 Received at Downey PD at 12:30:51 on trunk 235 TTY window did not automatically open, no tones were heard and 4 spaces sent did not launch the TTY window Downey PD manually launched the TTY window Texter's initial text was not received by Downey PD Messages from texter are slightly garbled Downey PD initiates transfer to Downey Fire Downey PD disables TTY screen and announces to Fire verbally that the call is a text transfer Downey PD releases the line Downey Fire and texter are on the line and able to text back and forth Texts are received at Fire without any garbling End session initiated by Downey Fire Test text from 916-202-XXXX Received at Downey PD at 12:49:43 on trunk 170 TTY window opens automatically but first text from texter is very garbled Downey PD initiates a transfer to Downey Fire and introduces transfer verbally to Fire Downey PD releases the line and Fire and texter are able to send messages back and forth Messages are clear between Downey Fire and texter Downey Fire initiates a transfer back to Downey PD using star code Downey PD receives transferred call on trunk 167 – live 9-1-1 trunk not a text test trunk Downey PD and texter are now able to text back and forth Messages on the live trunk are not garbled at Downey PD End session initiated by Downey PD Verizon made a change to point the Text Test ESN 845 to Downey PD's active 9-1-1 trunks instead of to the two text test 9-1-1 trunks Test text from 916-698-XXXX Received at Downey PD at 13:05:31 on trunk 91 Texts received from texter at Downey PD are slightly garbled

	Downey PD transfers to Downey Fire on 9-1-1 trunk and verbally announces that this is a text transfer then releases the line Texter receives TTY greeting message from Downey Fire and Fire and texter are able to exchange text messages back and forth without garbling Downey Fire places texter on hold while they answer another 9-1-1 call Texter sends message while on hold but it is not received by Fire Downey Fire takes texter off hold and is again able to send clear messages back and forth Downey Fire transfers texter back to Downey PD Downey PD receives transferred call on trunk 151 – live 9-1-1 trunk Downey PD and texter able to text back and forth and messages are not garbled Downey PD initiates another transfer to Downey Fire Text received by Downey Fire on trunk 167 Again able to text back and forth between Downey Fire and texter Messages are garbled at Downey Fire this time End session initiated by Downey Fire

CASE #4	Test a transfer to CSU Long Beach PD
Objective/ Description	This test will determine if the transfer goes to CSU Long Beach on their existing 911 trunks via standard TTY or if it will be delivered to CSU Long Beach's GEM text application via their web browser
Resources	1. Texter in Downey PD's jurisdiction 2. Verify TCC is provisioned and ready 3. Verify Downey PD is available. 4. Verify CSU Long Beach is available
Test Setup	1. Mobile phone activated and ready 2. Verify TCC is provisioned and ready 3. Verify Downey PD and CSU Long Beach PD are available.
Procedure	1. Send a SMS Text message to Downey PD 2. Send a couple of messages back and forth 3. Transfer SMS Texter to CSU Long Beach PD 4. Once CSU Long Beach PD is on the call send a few messages 5. Downey PD releases the text session 6. Once Downey is off the call have TTY caller exchange a few messages with CSU Long Beach PD have CSU Long Beach release
Verification	1. Verify CSU Long Beach was added to the session 2. Verify all parties can see the SMS Text messages. 3. Verify how text transfer was received at CSU Long Beach (TTY or GEM)
Text time	Text session 1 send to receive:
Notes	Document all aspects of transfer Test text sent from 916-202-XXXX at 11:37:02 Received on trunk 235 at 11:37:38 TTY window did not open, call taker opened manually and sent canned message "9-1-1 do you need police" received by texter. Texter sent "Transfer me to CSULB" Received with little garbling. Call transferred to CSULB PD "9-1-1 what is your emergency" was garbled back from CSULB on call taker screen. Downey PD sent "This is Downey PD with a transfer test. CSULB sent "Ready for your transfer" Texter and call takers are able to conference between all three parties. Downey PD is unable to distinguish between CSULB and texter messages within their screen. Downey PD was able to drop from the call and hang up the line and the conversation was able to continue between texter and CSULB. End session initiated by Downey PD and CSULB PD.

Test #5	Text Conversation when device powered down powered back up
Objective/ Description	This test verifies the text conversation continues even if the mobile phone is powered down and turned back on within 5 minutes. (in previous testing on January 8th this test did not work)
Resources	Texter in field and centroid within Downey PD's jurisdiction 9-1-1 Call taker Timer
Test Setup	1. Mobile phone activated and ready 2. Verify TCC is provisioned and ready 3. Verify the target PSAP is available.
Procedure	1. Send SMS to 911 to initiate a dialog 2. Respond to the incoming RFA at the PSAP and send a few messages back and forth between the PSAP and mobile 3. Texter powers down mobile phone. 4. PSAP to send another text while phone is powered down. 5. Texter powers on phone after waiting 5 minutes 6. PSAP verifies original SMS conversation is up. 7. Texter sends SMS to continue same text session 8. Respond to the incoming RFA at the PSAP and send a few messages back and forth between the PSAP and texter . 9. PSAP ends text session
Verification	1. PSAP and texter verifies status of SMS conversation was continuous, verify no automatic message was delivered by PSAP or TCS because of time between text messages.
Text time	Send to receive:
Notes	Test text from 916-698-XXXX at about 15:30 "Help I need help" Received at 15:31:18 on trunk 170 garbled slightly "I need xlp" PSAP and texter exchange several messages. PSAP is receiving slightly garbled messages from texter. Texter powers down phone. PSAP sends text message while phone is powered down. Texter powered phone back on and received text message from PSAP that was sent while phone was powered down. Texter sent reply "They are choking. Need help asap" PSAP received "They are chkng. Need hel asap gadhz" This message was interpreted by the call taker as checking instead of choking. End session initiated by Downey PD.

CASE #6	Verify ability for second call taker to take over SMS text session
Objective/ Description	This test verifies that a second call taker at Downey PD can take over a text session from initial call taker (In original test on January 8th this session acted as a conference call, with both call takers active on the text session. Redo this test and have call taker 1 place the texter on hold prior to Call taker 2 picking up the session.)
Resources	Texter in field and centroid within Downey PD's jurisdiction Call taker to receive text Second call taker available to take over text TCS to monitor text session
Test Setup	1. Verify Texter is ready 2. Verify the target PSAP is available.
Procedure	1. Send SMSText message to 9-1-1 2. Downey PD to reply to Texter 3. Exchange a few texts 4. Place texter on hold 5. Have second call taker at Downey PD take over text session from another call taker position 6. Have second call taker exchange a few texts 7. Have Downey PD end text session
Verification	1. Verify text was received by first call taker 2. Verify second call taker is able to takeover text session 3 Verify second call taker can see the entire text session 3. Verify release message received by Texter.
Text time	Send to receive:
Notes	How is this accomplished at the PSAP? Document exact words sent and received Test text sent from 916-698-XXXX at 16:16:55 Received at PSAP at 16:17:24 with no tones, no window automatically opening and no first message from the texter Call taker opened TTY window and sent "9-1-1 need police fire ambulance" Texter sent two messages in return, both received garbled slightly at the PSAP. Call taker conferenced in a second call taker at the PSAP. Texter sent "help help help" Received by each call taker at the PSAP, but each call taker received the same message differently. Call taker 1 received "HEBP HEL HELP" Call taker 2 received "HELP HELP HELP" Call taker 1 dropped the line. Texter and call taker 2 continue to exchange messages, but they are garbled at the PSAP side. End session initiated by Downey PD.

CASE #7	Verify results when texter sends more than 160 characters
Objective/ Description	This test will indicate the results when a text is sent with over 160 characters
Resources	Texter in field and centroid within Downey PD's jurisdiction. Call taker to receive text TCS to monitor text session Timer to time send receive time
Test Setup	1. Mobile phone activated and ready 2. Verify TCC is provisioned and ready 3. Verify the target PSAP is available.
Procedure	1. Send the following text message: **Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.** Which totals 380 characters. 2. PSAP sends response to initial text. 3. Texter sends text containing following symbols embedded in the text: @ # % & 4. Downey PD call taker ends text session 5. If screen shot is available please ask call taker to print the screen
Verification	1. Verify the initial SMS text was received by the PSAP 2. Verify the transcript is received by the PSAP 3. Verify texter received the disconnect session text from PSAP
Text time	Send to receive:
Notes	Document exact words sent and received Test text sent from 916-698-XXXX at 15:42:40 "Test to 9-1-1 for long text" Received at PSAP at 15:42: 47 on trunk 235. Only one letter dropped Long text sent at 15:47:00 PSAP received text completely once and then the text repeated with partial messages a second and third time. Message is very garbled at the PSAP all three times. PSAP able to return a message once text finished coming through, which the texter received fine End session initiated by Downey PD

CASE #8	**Test results of texter and Call taker sending simultaneous messages and have texter send five SMS messages in a row with no response from the call taker**
Objective/ Description	To see if garbled or no data exchanged on simultaneous text messages. Will call taker receive all 5 text messages sent rapidly in a row
Resources	1. Texter in Downey PD jurisdiction 2. One call taker at Downey PD
Test Setup	1. SMS texter ready in field 2. Downey PD call taker ready
Procedure	1. Send text] 2. Downey respond to texter 3. Have Downey and texter ready to send simultaneous text and repeat 4. Send test 5. Texter sends 5 rapid texts in a row –Downey PD does not respond.
Verification	1. Verify results of simultaneous texts 2. Verify results of 5 rapid texts
Text time	Send to receive:
Notes	This test was not explicitly performed. However, we did perform this action during previously described test cases, where Downey PD sent many text messages sequentially or the texter sent many messages sequentially. If the call taker is sending many sequential messages and the texter happens to have a text message process through the Verizon Wireless SMSC and the TCC and send to the PSAP during the same transmission time, the message has the potential of being "blocked" by the call taker from being received at the PSAP. Due to latency and delay in the networks, it cannot be determined whether a message sent by the texter or call taker will be received by the call taker or texter. Neither parties receive a notification of receipt indicating that the other party has received the prior message sent.

CASE #MISC	Test results for miscellaneous tests performed in addition to those listed above
Objective/ Description	Test transfers from CSU Long Beach PD to Downey PD using phones with and without location agent and vice versa
Resources	1. Texter in Downey PD jurisdiction with location agent and non-location agent phones with sessions already active at CSU Long Beach PD 2. One call taker at Downey PD 3. One call taker at CSU Long Beach PD
Test Setup	1. SMS texter in Downey PD jurisdiction with location agent and non-location agent phones with sessions already active at CSU Long Beach PD 2. Downey PD call taker ready 3. CSU Long Beach PD call taker ready
Procedure	1. Transfer text 2. Downey respond to texter 3. Downey return texter to CSU Long Beach via TTY transfer
Verification	1. Verify texter may be transferred back and forth within a single session
Text time	Send to receive:
Notes	Test transfer from 562-252-XXXX at 15:53:27 (Greg's flip phone) Texter activated session at CSU Long Beach (GEM9-1-1) with phone Texter drove phone to Downey PD while the session was active CSU Long Beach PD performed a rebid for updated location with texter at Downey PD Texter's location information was updated at CSU Long Beach PD Transfer button was engaged in GEM9-1-1 CSU Long Beach PD transferred the call to Downey PD and released session Downey PD received on trunk 170 Downey received no tones and TTY window did not open automatically SMDC BLDM was received from the texter at Downey PD, very garbled Able to text back and forth between Downey PD and texter but texts from texter are garbled Downey PD transferred the call back to CSU Long Beach PD with a verbal introduction when CSU Long Beach picked up the line Downey PD released the line CSU Long Beach received the transfer as a TTY call CSU Long Beach and texter able to send messages back and forth End session initiated by CSU Long Beach PD Test transfer from 949-677-XXXX at 16:04:40 (location agent phone) Texter activated session at CSU Long Beach (GEM9-1-1) with phone Texter drove phone to Downey PD while the session was active CSU Long Beach PD performed a rebid for updated location with texter at Downey PD Texter's location information was updated at CSU Long Beach PD Transfer button was engaged in GEM9-1-1 CSU Long Beach PD transferred the call to Downey PD and released session Downey PD received on trunk 235, but answered prior to second ring by call taker No ANI/ALI information available Not able to perform request for updated location End session initiated by Downey PD Test text from 949-677-XXXX at 16:08 Received at Downey PD at 16:08:50 on trunk 170 TTY window did not open automatically and initial text was not received

	Downey PD manually launched TTY window Downey PD and texter send messages back and forth Message from texter is only slightly garbled Location is initially 33.94129500, -118.134248, uncertainty 1552 meters, 75% Rebid at 16:09:56 with Phase I return Rebid at 16:10:28 with Phase I return, location agent activated on phone Rebid at 16:11:30 with updated Phase I location returned 33.94045800, -118.128819 Rebid again with updated Phase I location returned again 33.94056500, -118.128798 No Phase II received End session initiated by Downey PD